Portable Natural Generated Programs

As of Natural Version 5, Natural generated programs (GPs) are portable across the platforms UNIX, OpenVMS and Windows.

This document covers the following topics:

- Compatibility
- Endian Mode Considerations
- ENDIAN Parameter
- Transferring Natural Generated Programs

Compatibility

A GP which is cataloged with Natural Version 5 on any Natural-supported UNIX, OpenVMS and Windows platform is then executable with Natural Version 5 on these platforms without recompilation. This feature simplifies the deployment of applications across open systems platforms.

Natural applications generated with Natural Version 4 or Natural Version 3 can be executed with Natural Version 5 without cataloging the applications again (upward compatibility). In this case, the portable GP functionality is not available. To make use of the portable GP and other improvements, cataloging with Natural Version 5 is required.

Command processor GPs and Natural Expert GPs are not portable. The portable GP feature is not available for mainframe platforms. This means that Natural GPs which are generated on mainframe computers are not executable on UNIX, OpenVMS and Windows platforms without recompilation and vice versa.

Endian Mode Considerations

Depending on which UNIX, OpenVMS or Windows platform Natural Version 5 is running, Natural Version 5 will consider the byte order in which multi-byte numbers are stored in the GP. The two byte order modes are called "Little Endian" and "Big Endian".

- "Little Endian" means that the low-order byte of the number is stored in memory at the lowest address, and the high-order byte at the highest address (the little end comes first).
- "Big Endian" means that the high-order byte of the number is stored in memory at the lowest address, and the low-order byte at the highest address (the big end comes first).

The UNIX, OpenVMS and Windows platforms use both endian modes: Intel processors and AXP computers (Natural on Windows or OpenVMS) have "Little Endian" byte order and HP machines have "Big Endian" mode.

Natural Version 5 converts a portable GP automatically into the Endian mode of the execution platform if necessary. This endian conversion is not performed if the GP is already generated in the endian mode of the platform.

ENDIAN Parameter

In order to increase execution performance of portable GPs, the profile parameter ENDIAN has been introduced. ENDIAN determines the Endian mode in which a GP is generated during compilation:

DEFAULT	The endian mode of the machine on which the GP is generated.
BIG	Big endian mode (high order byte first).
LITTLE	Little endian mode (low order byte first).

The values DEFAULT, BIG and LITTLE are alternatives whereby the default value is DEFAULT.

The ENDIAN mode parameter may be set

- as a profile parameter with the Natural Configuration Utility,
- as a start-up parameter,
- as a session parameter or with the GLOBALS command.

Transferring Natural Generated Programs

To make use of the portable GP on different platforms (UNIX, OpenVMS, Windows), the generated Natural objects must be transferred to the target platform or must be accessible from the target platform, for example, via NFS.

Using the Object Handler SYSOBJH SYSOBJH is the recommended way to distribute Natural generated objects or even entire Natural applications. This is done by unloading the objects in the source environment into a work file, transferring the work file to the target environment and loading the objects from the work file.

▶ To deploy your Natural generated objects across open systems platforms

1. Start the Natural Object Handler.
   Unload all necessary cataloged objects into a work file of type "portable".
   Error messages, if needed, can also be unloaded to the work file.
   Important:
   The specified work file type must be portable. PORTABLE performs an automatic Endian conversion of a work file when it is transferred to a different machine.
   See also Work File Type in the section Define Work File in the Natural Statements documentation.
2. Transfer the work file to the target environment.
   Depending on the transfer mechanism (network, CD, diskette, tape, email, download, etc.), the use of a compressed archive such as a ZIP file or encoding with UUENCODE/UUDECODE or similar may make sense.
   Copying via FTP requires binary transfer type.
   Note:
   According to the transfer method used, it may be necessary to adjust the record format and attributes or block size of the transferred work file depending on the specific target platform, before continuing with the load function. The work file should have the same format and attributes on the target platform as a work file of the same type that was generated on the target platform itself. Use operating system tools if an adaptation is necessary.
3. Start the Natural Object Handler in the target environment.
   Select portable as work file type.
   Load the Natural Objects and error messages from the work file.

For more details on how to use the Natural Object Handler, refer to the SYSOBJH SYSOBJH utility documentation.

Beside the aforementioned preferred method, there are various other ways of "moving" or copying single Natural generated objects or even entire libraries or parts thereof, using operating system tools and different transfer methods. In all of these cases, to make the objects executable by Natural, they have to be imported into the Natural system file FUSER so that the FILEDIR.SAG structure is adapted.

This can be done with either of the following methods:

- Using the Import function of the SYSMAIN utility.
- Using the FTOUCH utility.
  This utility can be used without entering Natural.

The same applies when direct access is possible from a target platform to the generated objects in the source environment, for example, via NSF, network file server, etc. In this case, the objects have to be imported, too.

Note:

With Natural Version 5.1, it is not yet supported to share a common FNAT or FUSER system file among different open system platforms. The FILEDIR.SAG file is not yet platform-independent.